Kemampuan Penalaran dan Argumentasi Ilmiah Siswa SMP melalui Pembelajaran IPA Menggunakan Model *Levels of Inquiry* berbasis *Sosio-Scientific Issue* pada Materi Pemanasan Global

TESIS

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar
Magister Pendidikan Ilmu Pengetahuan Alam

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LEMBAR HAK CIPTA

KEMAMPUAN PENALARAN DAN ARGUMENTASI ILMIAH SISWA SMP MELALUI PEMBELAJARAN IPA MENGGUNAKAN MODEL *LEVELS OF INQUIRY* BERBASIS *SOSIO-SCIENTIFIC ISSUE* PADA MATERI PEMANASAN GLOBAL

Oleh
LABITTA HAREKA PUTRI

Sebuah Tesis yang Diajukan untuk Memenuhi Sebagian dari Syarat
untuk Memperoleh Gelar Master Pendidikan
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PERNYATAAN KEASLIAN TESIS

Dengan ini saya menyatakan bahwa tesis dengan judul "Kemampuan Penalaran dan Argumentasi Ilmiah Siswa SMP melalui Pembelajaran IPA Menggunakan Model *Levels of Inquiry* berbasis *Sosio-Scientific Issue* pada Materi Pemanasan Global" ini beserta seluruh isinya adalah benar-benar karya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung resiko atau sanksi apabila dikemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

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ABSTRAK

Tujuan penelitian ini adalah untuk memperoleh informasi perubahan kemampuan penalaran dan argumentasi ilmiah siswa setelah diterapkan model *levels of inquiry* berbasis *Sosio-Scientific Issue* pada pembelajaran IPA Materi Pemanasan Global. Tahapan *Levels of Inquiry* yang digunakan pada penelitian ini meliputi tiga tahap yaitu, *Discovery Learning, Interactive Demonstration,* dan *Inquiry Lesson.* Pada setiap tahapan *Levels of Inquiry* memiliki lima sintaks pembelajaran yaitu *observation, manipulation, generalization, verification* dan *generalization.* Metode yang digunakan adalah *weak experiment* dengan desain *One Group Pre-test and Post-test.* Subjek penelitian ini adalah siswa kelas 7 di salah satu SMP di kota Cimahi sejumlah 34 siswa. Berdasarkan analisis data, kemampuan penalaran ilmiah siswa memperoleh nilai N-gain sebesar 0,43 dengan kategori N-gain sedang. Persentase jumlah siswa berdasarkan kategori N-gain yaitu rendah 26,5%, sedang 58,8%, dan tinggi 14,7%. Pencapaian jumlah siswa dengan N-gain tertinggi tiap aspek yaitu *proportional reasoning* pada kategori tinggi sebesar 50,0%, *control of variable* pada kategori rendah sebesar 70,6%, *inductive reasoning* pada kategori tinggi sebesar 47,1%, *correlational reasoning* pada kategori sedang sebesar 41,2%, dan *hypothetical deductive reasoning* pada kategori sedang sebesar 50,0%. Selanjutnya, untuk kemampuan argumentasi ilmiah siswa memperoleh nilai N-gain sebesar 0,39 dengan kategori gain sedang. Persentase jumlah siswa berdasarkan kategori N-gain yaitu rendah 29,4%, sedang 61,8% dan tinggi 8,8%. Pencapaian jumlah siswa dengan N-gain tertinggi tiap aspek yaitu klaim pada kategori tinggi sebesar 50,0%, data pada kategori rendah sebesar 47,1%, *warrant* pada kategori rendah sebesar 38,2%, dan *backing* pada kategori sedang sebesar 55,9%. Berdasarkan hasil tersebut, dapat disimpulkan bahwa penerapan model *Levels of Inqury* berbasis *Socio-scientific Issue* pada pembelajaran IPA Materi Pemanasan Global dapat meningkatkan kemampuan penalaran dan argumentasi ilmiah siswa.

Kata kunci: Penalaran ilmiah, Argumentasi ilmiah, *Levels of Inquiry, Socio-scientific Issue*

ABSTRACT

The purpose of this study was to obtain information on changes in students' scientific reasoning and argumentative abilities after applying the level of inquiry model based on Socio-Scientific Issues in Global Warming Materials. The Levels of Inquiry stages in this study include three stages, namely, Discovery Learning, Interactive Demonstration, and Inquiry Lesson. At each stage Levels of Inquiry has five learning syntax, namely observation, manipulation, generalization, verification and generalization. The method was a weak experiment with One Group Pre-test and Post-test design. The subjects of this study were grade 7 students in one of junior high school in Cimahi with a total of 34 students. Based on data analysis, the scientific reasoning ability of students obtained an N-gain value of 0.43 with a moderate N-gain category. The percentage of students based on the N-gain category are low 26.5%, moderate 58.8%, and high 14.7%. The achievement of the number of students with the highest N-gain in every aspect are proportional reasoning in the high category by 50.0%, control of variables in the low category by 70.6%, inductive reasoning in the high category by 47.1%, correlational reasoning in the medium category by 41.2%, and hypothetical deductive reasoning in the medium category by 50.0%. Furthermore for the scientific argumentative ability, students obtain an N-gain value of 0.39 with the medium gain category. The percentage of students based on the N-gain category are low 29.4%, medium 61.8% and high 8.8%. The achievement of the number of students with the highest N-gain in every aspect are claims in the high category by 50.0%, data in the low category by 47.1%, warrant in the low category by 38.2%, and backing in the medium category by 55.9 %. Based on these results, it can be concluded that the application of the Socio-scientific Issue-based Levels of Inqury model to the learning of Science on Global Warming Material can improve students' scientific reasoning and argumentative abilities.

Key words: Scientific reasoning, Scientific Argumentative, Levels of Inquiry, Socio-scientific Issue

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